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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,997	04/25/2006	Michalakis Averkiou	US030442US	7249

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PHILIPS INTELLECTUAL PROPERTY & STANDARDS
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EXAMINER	
MEHTA, PARIKHA SOLANKI	
ART UNIT	PAPER NUMBER
3737	
MAIL DATE	DELIVERY MODE
09/23/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,997	AVERKIOU ET AL.	
	Examiner	Art Unit	
	PARIKHA S. MEHTA	3737	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,4,5,7,8,11 and 12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4,5,7,8,11 and 12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *19 July 2009* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1, 4, 5, 8, 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art in view of Brock-Fisher et al (US Patent No. 5,577,505), hereinafter Brock-Fisher ('505), of record.

Regarding claims 1, 4 and 11, Applicant admits that it is known in the art to transmit a single plane wave of microbubble-destroying ultrasound into tissues encompassing a first area, repetitively transmit a plurality of beams of imaging ultrasound having an intensity insufficient to destroy microbubbles into the tissues, receive reflections from each of the imaging ultrasound beams, and process the received reflections over a sufficient period to allow reperfusion of the tissues to provide an ultrasound perfusion image (Specification p. 3 paragraph 2, p. 4 paragraph 1). The admitted prior art does not expressly teach that the imaging ultrasound has a second area smaller than the first area, or that the received beams have a third area that is smaller than the first area. In the same field of endeavor, Brock-Fisher ('505) teaches that decreasing the size of the transmit aperture (i.e., transmit "area") is effective to decrease transmit power (col. 2 lines 60-67). As such, it would have been obvious to one of ordinary skill in the art at the time of invention to have performed the admitted prior art method by transmitting the imaging beam at a smaller area in order to achieve the step of transmitting at a power insufficient to

destroy the microbubbles, in view of the teachings of Brock-Fisher ('505). A skilled artisan would also recognize that, if the imaging transmit beam is of a smaller area, it would be necessary to transmit multiple imaging beams over the interrogation area (i.e., a plurality of second areas which substantially encompass the first area) in order to obtain a complete image of the area of interest.

Regarding claim 5, the admitted prior art teaches the transmission of a sequence of plane waves (Specification p. 4 paragraph 2).

Regarding claim 8, the area of a reflected ultrasound beam is inherently proportional, i.e. "substantially" the same as, the area of the transmit beam from which it is generated.

Regarding claim 12, the admitted prior art plane wave constitutes a "broad beam" of ultrasound.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art and Brock-Fisher ('505) as applied to claim 1 above, and further in view of Hwang et al (US Patent No. 5,706,819), hereinafter Hwang ('819), of record.

Neither the admitted prior art nor Brock-Fisher ('505) teach that the imaging ultrasound is transmitted at a first frequency and the reflection beams are received at a harmonic of the first frequency. In the same field of endeavor, Hwang ('819) teaches that receiving reflected ultrasonic beams at a harmonic of the transmit frequency is useful for clutter rejection (col. 1 lines 42-43). It would have been obvious to one of ordinary skill in the art at the time of invention to have performed the methods of the admitted prior art and Brock-Fisher ('505) by receiving the reflected image beams at a harmonic of the transmit beam frequency, in view of the teachings of Hwang ('819).

Response to Arguments

1. Applicant's arguments filed 19 July 2009 have been fully considered but they are not persuasive.

Applicant attacks Brock-Fisher for not teaching transmission of a plane wave of a large area followed by transmission of imaging beams of a smaller area (Remarks p. 7). Examiner notes that Brock-Fisher was not relied upon as supplying such feature in the previous rejection; rather, Applicant's admitted prior art was relied upon as teaching the transmission of a high intensity ("large area") beam followed by a lower intensity ("smaller area") beam (see disclosure p. 3 paragraph 2). Accordingly, Applicant's arguments have no bearing on the propriety of the previous rejection.

Applicant also argues that the previous rejection is improper because Brock-Fisher lacks plane waves (Remarks p. 7 paragraph 3 - p. 8 paragraph 1). Examiner notes that Brock-Fisher was not relied

upon as supplying such feature in the previous rejection; rather, Applicant's admitted prior art was relied upon as teaching plane waves, as evidenced by the disclosure at page 4, paragraph 1 ("[a] phased array transducer transmits a single plane wave beam…"). Accordingly, Applicant's arguments have no bearing on the propriety of the previous rejection.

Furthermore, Applicant fails to adequately distinguish plane waves from beams in the same paragraph of the disclosure ("plane wave beam"); as such, a plane wave itself can be interpreted to constitute a beam of ultrasound energy. As such, any argument directed towards attacking a reference for teaching a plane wave but not a beam or vice versa is unpersuasive.

As Applicant's arguments are wholly unpersuasive for at least the foregoing reasons, the previous rejection of all pending claims in view of the prior art of record are maintained and reiterated herein.

2. Applicant's amendments of 19 July 2009 are sufficient to overcome the previous objections to the drawings, claims and specification, as well as the previous rejection under 35 U.S.C. 112, which are hereby vacated accordingly.

Conclusion

3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PARIKHA S. MEHTA whose telephone number is (571)272-3248. The examiner can normally be reached on M-F, 8 - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Brian Casler can be reached on 571.272.4956. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/BRIAN CASLER/
Supervisory Patent Examiner, Art Unit 3737

/Parikha S Mehta/
Examiner, Art Unit 3737